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SNARES OF ORB-WEAVING SPIDERS.

By REV. HENRY C. MCCOOK, D. D.

The characteristics upon which the true spiders should be classified into principal groups have not been agreed upon by araneologists. Without entering upon the discussion I have accepted the arrangement of Prof. Thorell of Upsala, which is substantially that of Latreille, and is based upon the spinning habits of the animal. That it is open to objection, can readily be shown; but on the whole it appears more satisfactory than any other. In accordance with this arrangement we have two great groups or divisions; *first*, the Sedentary Spiders, whose habit is to remain (for the most part) upon or in their web and capture their prey by means of snares; *second*, the Wandering Spiders, who hunt their food upon the ground, the water or trees. The first division is subdivided into sections according to the general character of the web; the second, according to the chief peculiarity of the spider's action or gait.

The following tabulated statement will present this arrangement:—

CLASS ARACHNIDA.

ORDER ARANEA.

I. *First Division.*

Sedentary Spiders.

Section 1. Orbitelariæ, Orb-weavers.

“ 2. Retitelariæ, Line-weavers.

“ 3. Tubitelariæ, Tube-weavers.

“ 4. Territelariæ, Tunnel-weavers.

II. *Second Division.*

Wandering Spiders.

Section 5. Citigradæ,¹ Citigrades.

“ 6. Laterigradæ, Laterigrades.

“ 7. Saltigradæ, Saltigrades.

¹ Prof. Thorell assigns the Laterigrades to the 5th section, the Citigrades to the 6th. I have ventured to so far change this arrangement as to reverse the positions of the Laterigrades and Citigrades. The Citigrades appear to me to approach the Tubeweavers, both in structure and economy, more nearly than the Laterigrades. So also the step from the Citigrades to the Laterigrades though the genus *Dolomedes* appears more natural

This arrangement, based in the main upon the economy of the animal, will be found to harmonize closely with the classification into families, genera and species based upon structural characteristics.

I propose in this paper to apply this principle of arrangement according to economy to the first section of the Sedentary Spiders—the Orb-weavers. It should be understood that the classification proposed is simply tentative, and in its present form is incomplete. It is given with the hope that it may lead to something better by fixing the attention of the very few students of our spider-fauna, among whom no such grouping has hitherto been proposed. Moreover, it is hoped that the arrangement may have some interest to naturalists generally as bearing upon the correspondence between structure and economy and the value of habit as a factor in classification.

An orb-web may be defined as a series of right lines radiating from a common centre, and crossed at intervals by other right lines attached at the points of contact and covered by viscid beads. Orb-webs are divided generally into Vertical snares and Horizontal snares, according as they are perpendicular to, or parallel with, the plane of the horizon. The Vertical snares I have subdivided into (1) Full Orb, (2) Sectoral Orb, (3) Actinic Orb, (4) Orb Sector; the Horizontal Snares into (5) Plane Orb, (6) Domed Orb. I present the following table:—

ORB-WEAVERS' SNARES.

I. VERTICAL SNARES.

Snare spun vertically; spider hanging at the centre of the converged radii, or in a silken or silk-lined den.

1. Full Orbs.

Lines crossing all the radii spirally. (Forming complete circles.)

i. *Simple Snares*.—Simple orb of radiating straight lines and concentric circles.

a. The hub meshed. *Epeira insularis*, *E. strix*.¹

b. The hub open; central space ribboned or tufted. *Acrosoma rugosa*, *A. spinea*, *A. mitrata*, *Gasteracantha cancer*.

than the reverse, as Thorell has it; and the step to the Saltigrades from the Laterigrades is quite as, if not more, natural than from the Citigrades. From the standpoint of economy alone the passage is certainly easier.

¹ These are representative species of a large group.

c. The central space ribboned, cocoons and debris attached to the ribbon. *Cyrtophora caudata*.

ii. *Compound Snares*.—Orb partly surrounded by an irregular mass of crossed lines.

a. Central space sheeted or ribboned; wings or guards of crossed lines. *Argiope riparia*, *A. fasciata*.

b. Hub meshed; mass of line-weaving above containing the spider's home and cocoons. *Epeira labyrinthica*.

2. Sectoral Orb.

Radii crossed by lines forming nearly complete circles.

i. *Simple Snares*.

a. Hub meshed (?); the beaded spirals divided into bands by an unbeaded line and space. *Nephila plumipes*.

ii. *Compound Snares*.

a. Hub meshed; tubular den or tent in the reticular web. *Epeira globosa*, *E. thaddeus*.¹

3. Actinic Orb.

Snare composed of several rays or orb-sectors bound together into an orb.

i. *Simple Snares*.

a. Hub wanting; a large, irregular, open central space. The radii prolonged into a trap-line. *Epeira radiosa*.

4. Orb Sector.

Snare, a sector of an orb.

i. *Simple Snares*.

a. Sector composed of four radii converging upon a single trap-line; radii crossed by notched lines. *Hyptiotes cavata*.

II. HORIZONTAL SNARES.

Snare spun horizontally; spider usually hanging beneath.

5. Plane Orb.

Snare, a circular plane.

i. *Simple Snares*.

a. Hub open. *Tetragnatha extensa*; *T. grallator*.

b. Hub finely notched; central space ribboned. *Uloborus riparia*.

ii. *Compound Snares*.—A maze of crossed lines spun below the orb.

a. Hub open. *Epeira hortorum*; *E. gibberosa*.¹

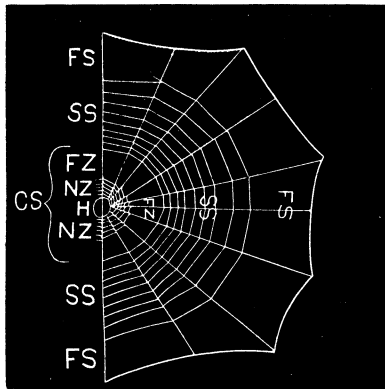
¹ The generic classification of Hentz is here retained.

6. Domed Orb.

Snare elevated into a dome by a pyramidal mass of crossed right lines.

i. Concentric lines all notched; spider hanging beneath the centre. *Epeira basilica.*

Several technical terms in this table, which I have been compelled to invent, require explanation. I have divided an orb-web into three parts. *First*, beginning at the outer margin, the Foundation Space, the open space between the foundation lines or



FS=Foundation space.

SS=Spiral space.

CS=Central space.

{ FZ=Free zone.
NZ=Notched zone.
H=Hub.

frame, and the beaded spirals; *second*, the Spiral Space, that part covered by the spiral lines; *third*, the Central Space, the central circle enclosed by the spiral space. The central space is subdivided into three parts, first the hub, the small open or meshed circle upon which the radii meet; second, the Notched Zone, a series of unbeaded spirals lying next to the hub which do not cross the radii directly, but a little above the point of contact; and third, the Free Zone, a part free from crossed lines

between the notched zone and the spiral space.